

**RESERVE COPY****PATENT SPECIFICATION**

Application Date: Jan. 3, 1936.

No. 231/36.

**463,460**

Complete Specification Left: Feb. 3, 1937.

Complete Specification Accepted: March 31, 1937.

**PROVISIONAL SPECIFICATION****Improvements in, or relating to, Electrical Switch-fuse Combinations**

We, J. A. CRABTREE & COMPANY LIMITED, a British Company, and HAROLD FLETCHER McLOUGHLIN, a British Subject, both of Lincoln Works, Lincoln Road, Walsall, Staffordshire, do hereby declare the nature of this invention to be as follows:—

This invention has reference to electrical switch-fuse combinations, and particularly to combination units that comprise an automatic switch or circuit-breaker and a system of switch-protective fuses arranged in the phases of a multiphase supply system; the switch and its associated parts and the fuses being housed or installed in separate compartments of the casing of the unit.

In combination units of this type, the fuses are usually installed in a fuse-box or compartment whose lid or cover is so hinged to the body of the casing as to enable access to be obtained in the said fuses for replacement or inspection, and the principal object of the present invention is to provide for the embodiment in the unit of a simple but efficient system which ensures that access can only be obtained to the fuse-box when the fuses are not carrying current.

According to the said invention, it is proposed to attain this object by embodying in the switch-box of a unit of the type referred to, an auxiliary switch which is contained in the same circuit as the operating or hold-on coil of the automatic switch or circuit-breaker and is so controlled by the switch-box lid that normally, or so long as the said lid is closed, the auxiliary switch is also held closed to enable the opening and closing of the automatic switch by a "stop" and "start" control and also to enable the automatic opening of the said switch by its thermally-sensitive or other releases in the event of an overload or other abnormal condition being imposed on the supply system. On the other hand, should opening of the switch-box lid be commenced when

the operating magnet and fuse-containing circuits are closed, the contacts of the auxiliary switch are automatically separated, preferably by spring action, and the said magnet and fuse circuits are broken to ensure that the fuses are electrically dead before the box-lid can be opened sufficiently to enable access to the said fuses. The auxiliary switch also ensures that the fuses are not carrying current when they are withdrawn for replacement or to complete the isolation of the automatic switch from the supply mains.

In a typical construction according to the invention, it is proposed to arrange within a convenient part of the fuse-box, an auxiliary switch whose contact pieces are connected up in the circuit containing the operating coil of the automatic switch. Preferably the moving contact is in the form of a push-button and is so loaded by a spring that when no pressure is applied to the said button, the said spring holds the said moving contact in the circuit-breaking position. The push-button contact is operated against the thrust of its spring by a stud or other projection on the inside of the lid of the fuse-box; this stud preferably being disposed on a part of the said lid remote from the said hinge and in such a position that it maintains the push-contact positively closed against the fixed contact so long as the lid is normally shut and fastened. But by virtue of the above-mentioned location of the interlock stud, it follows that the pressure of the latter upon the push-contact is relieved immediately opening of the lid is started and the spring is permitted to separate the auxiliary contacts and open the automatic switch circuit.

Dated this 2nd day of January, 1936.

ARTHUR SADLER,  
Chartered Patent Agent,  
65, Temple Row, Birmingham 2.  
Agent for the Applicants.

**COMPLETE SPECIFICATION****Improvements in, or relating to, Electrical Switch-fuse Combinations**

We, J. A. CRABTREE & COMPANY LIMITED, a British Company, and HAROLD FLETCHER McLOUGHLIN, a British subject, both of Lincoln Works, Lincoln

[Price 1/-]

Pica 2s 6d

**BEST AVAILABLE COPY**

Road, Walsall, Staffordshire, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has reference to electrical switch-fuse combinations and particularly to combination units that comprise an automatic switch or circuit-breaker associated with protective fuses, the switch and its associated parts and the fuses being housed or installed in separate compartments of the casing of the unit.

In combination units of this type, the fuses are usually installed in a fuse-box or compartment whose lid or cover is so hinged to the body of the casing as to enable access to be obtained to the said fuses for replacement or inspection, and the principal object of the present invention is to provide for the embodiment in such a unit, of a simple but efficient system which ensures that access can only be obtained to the fuse-box when the fuses are not carrying current.

According to the said invention, it is proposed to attain this object by embodying in the fuse-box of a unit of the type referred to, an auxiliary switch which is contained in the same circuit as the operating or hold-on coil of the automatic switch or circuit-breaker and is so controlled by the fuse-box lid that normally, or so long as the said lid is closed, the auxiliary switch is also held closed to enable the opening and closing of the automatic switch by a "stop" and "start" control, and also to enable the automatic opening of the said switch by its thermally-sensitive or other releases in the event of an overload or other abnormal condition being imposed on the supply system. On the other hand, should opening of the fuse-box lid be commenced when the operating magnet and fuse-containing circuits are closed, the contacts of the auxiliary switch are automatically separated, preferably by spring action, thereby opening the magnet circuit and allowing the main circuit to be broken, thus ensuring that the fuses are electrically dead before the box-lid can be opened sufficiently to enable access to the said fuses.

A typical construction according to the invention is shown in the perspective view, Figure 1, and the enlarged scale section, Figure 2, of the accompanying drawings.

In this construction, the auxiliary switch  $\alpha$  is located inside the fuse-box  $b$

and its contact pieces are connected up in the circuit containing the operating coil of the automatic switch. Preferably, and as in the arrangement shown, the moving contact  $\alpha^1$  is in the form of a push-button and is so loaded by a spring  $\alpha^2$  that when no pressure is applied to the said button, the said spring holds the said moving contact in the circuit-breaking position. The push-button contact is adapted to be operated against the thrust of its spring by a stud or projection  $\alpha^3$  which is formed or provided on the inside of the hinged lid  $b^1$  of the fuse-box, and is disposed on a part of the said lid remote from the lid-hinge  $b^3$  and in such a position that it bears upon the push-contact and maintains the same positively closed against the fixed contact of the auxiliary switch so long as the lid is normally shut and fastened. But by virtue of this location of the interlock stud, it follows that the pressure of the latter upon the push-contact is relieved immediately the opening of the lid is commenced, and the spring is permitted to separate the auxiliary contacts and open the automatic switch circuit.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. A switch-fuse unit of the type referred to, comprising an auxiliary switch whose contacts are contained in the same circuit as the operating or hold-on coil of the automatic switch or circuit-breaker, and are controlled by the fuse-box lid substantially in the manner and for the purposes herein described.

2. A switch-fuse unit as claimed in Claim 1, wherein the fuse-box has a hinged lid and the moving contact of the auxiliary switch is controlled by a stud or projection on the inside of the said lid.

3. A unit as claimed in Claim 2, wherein the switch-controlling stud is located in a part of the lid remote from the hinge of the said lid.

4. A switch-fuse unit of the type referred to, embodying an electrical interlock substantially as herein described for enabling safe access to the fuses.

Dated this 2nd day of February, 1937.

ARTHUR SADLER,  
Chartered Patent Agent,  
Ocean Chambers, 44, Waterloo Street,  
Birmingham, 2.  
Agent for the Applicants.

Fig. 1.

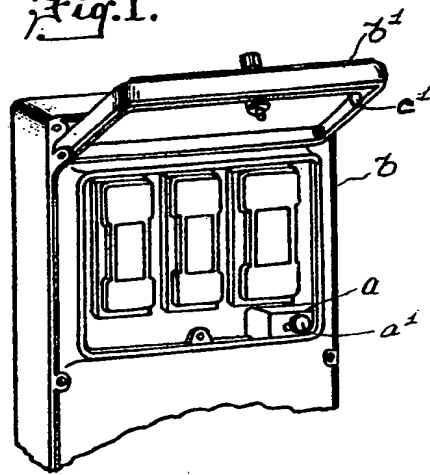
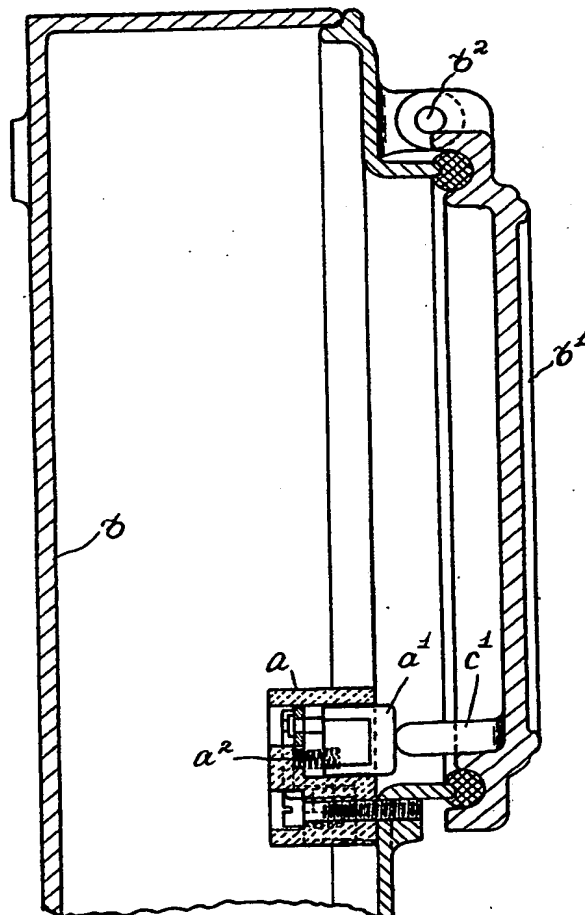


Fig. 2.



Malby &amp; Sons Photo-Litho.

BEST AVAILABLE COPY

[This Drawing is a reproduction of the Original on a reduced scale.]

THIS PAGE BLANK (USPTO)